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ON CASES OF BOTULISM DUE TO HOME-MADE  
CANNED FRUITS AND VEGETABLES

Following is a translation of an article by Candidate of Medical Sciences Ye.S. Krasnitskaya from the Main Sanitary Epidemiological Directorate of the Ministry of Public Health of the RSFSR in the Russian-language periodical Gigiyena i Sanitariya (Hygiene and Sanitation), No 10, Moscow, 1962, pages 73-74. The article was submitted for publication on 10 January 1962.

In our country the occurrence of botulism as a result of using the food products of the enterprises of the canning industry, because of the considerable sanitation measures which are employed at these enterprises, has almost been completely eliminated.

The individual outbreaks of botulism which are still recorded occur, as a rule, in ordinary life, are of a group or more often of a family nature, and in the main are the result of the consumption of food products prepared by an individual.

The study of the epidemiology of botulism in the RSFSR indicates that the main source of this ailment is fish products. In rare cases the outbreak of botulism was connected with the consumption of meat products.

With respect to vegetables and fruits, there was not a single case noted for a number of decades where the source of botulism was vegetable or fruit products.

Two cases of botulism which have occurred as a result of eating home-canned fruits and vegetables are therefore of great epidemiological interest.

In the first case three persons became ill (two adults and one child); the typical clinical aspects of botulism were present. The individuals experienced difficulty in breathing, a choking feeling, aphonia, diplopia, ptosis, and sharp adynamia which was accompanied by paresis of the legs; one person experienced vomiting; the stool was normal for all individuals. Death came at 19, 24, and 40 hours from the onset of the disease.

Epidemiological investigation indicated that the illness was connected with the consumption of an apricot compote which was prepared at home using ordinary home pasteurization (putting the glass jar with the compote into a kettle of boiling water).

The incubation period lasted from 5 to 33 hours. A laboratory test conducted at the Rostov Institute of Epidemiology, Microbiology, and Hygiene confirmed the diagnosis of botulism. *Botulinus bacilli* were isolated from the mesenteric gland, the liver, the brain and spinal cord, and the contents of the stomach of the cadaver. A biological test on mice with an extract from the compote was positive. After this the same strain was detected in sections from the lymph gland of the dead mouse. A biological test on mice using heated extracts from sections of the internal organs of the cadavers also gave a positive result.

The type of pathogen was not established exactly; The isolated strain was not agglutinated by diagnostic

serums types A and B.

The second case of botulism occurred as a result of eating home-canned wild onions (*Allium ursinum*). Two members of one family aged 48 and 22 became ill. The first symptoms of the disease appeared 8 to 20 hours after eating the wild onions and consisted of dizziness, diplopia, dryness in the mouth, and thirstiness. The persons began to vomit and experience spasms. Within a day their condition grew worse and they were hospitalized as a result. In the infirmary they experienced a worsening of their vision, ptosis, difficulty in swallowing, aphony, and acute weakness.

Examination indicated cyanosis of the skin, a dry tongue covered with a fine coating, enlarged pupils, and a normal stool; the temperature did not increase. Despite the steps which were taken (gastric lavage, administration of polyvalent ABE antitoxin serum), the persons died on the second and third days after the onset of the disease.

Upon opening the cadavers it was noted that there was polyemia of the internal organs; microcellular bleeding was observed on the apexes of the folds of the small intestine.

The epidemiological investigation revealed that fresh wild onions had been purchased at the market one and a half months prior to the outbreak of the disease and had been canned in half-liter glass jars. The canning of the wild onions was conducted in the following manner: boiling water was poured over the wild onions; they were placed in jars; and a vinegar solution was added. After this the jars were closed. The wild

onions were stored in a bathroom at a comparatively high temperature. Five jars of canned wild onions remained on hand at the time of the outbreak of the disease; four of them were infected.

The remaining preserves and the organs of the cadavers were subjected to a bacteriological investigation.

From the contents of one jar and the cadaver material, the pathogen of botulism was isolated (the isolated culture was not typed). By a positive biological test on mice it was proven that botulinus toxin was present in the material being tested. It is to be presumed that in both cases the raw food was not fresh and was covered with soil. The preserving was inadequate, and the long storage of the jars of wild onions under unfavorable temperature conditions facilitated the accumulation of the toxin.

It should be noted that in connection with the considerable development of fruit and vegetable growing in our country, the preserving of fruits and vegetables in the homes is becoming more and more significant.

The improper preparation of preserves, as can be seen from the cases which have been described, can lead to tragic consequences. Therefore, in order to prevent this fatally dangerous disease among the population, it is necessary to perform educational work and to propagandize the proper methods of preserving food. In order to increase the quality and safety of canned fruits, they should be prepared immediately after they have been gathered, because they spoil quickly when stored for a long time, especially in a

warm place. Over-ripe fruits are not suitable for canning because they not only quickly become too soft but, more importantly, because they are more difficult to wash and because pieces of dirt can stick in the wrinkles. Before canning fruit, it should be carefully washed with potable water. In order to destroy the microflora and achieve complete sterility in the jars, it is necessary to maintain an appropriate temperature for a certain length of time. For example, the sterilization in water of compotes which have been placed in liter jars should last for 20 minutes at a temperature of 75 degrees Centigrade. If the temperature of the water is higher, the sterilization time can be shortened accordingly (at 80 degrees -- 15 minutes; at 85 degrees -- 10 minutes; at 90 degrees -- 6 minutes; at 95 degrees -- 3 minutes). After cooling, the tightness of the seal on the jars should be checked.

Before storing the jars they should be wiped dry. It is recommended that the preserves be stored in a cool, dry place which is protected from the sun. The temperature of the place should not exceed 15 degrees centigrade.

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